

Solving Trigonometric Equations

1. Solve each equation for θ , where $0^\circ \leq \theta < 360^\circ$.

- a. $\sqrt{2}\cos\theta - 1 = 0$
- b. $\cot\theta - \sqrt{3} = 0$
- c. $2\sin\theta + 1 = 0$
- d. $3\sec\theta + 6 = 0$
- e. $\sin\theta = \cos\theta$
- f. $\sin\theta = -\cos\theta$
- g. $\sin\theta - \cos\theta = 0$
- h. $\sin\theta + \cos\theta = 0$

2. Solve each equation for θ , where $0^\circ \leq \theta < 360^\circ$.

- a. $(2\cos\theta - 1)(2\cos\theta + 1) = 0$
- b. $(2\sin\theta - 1)(\sin\theta + 1) = 0$
- c. $(\tan\theta - \sqrt{3})(\sec\theta - 2) = 0$
- d. $(\sqrt{3}\sec\theta - 2)(\sqrt{3}\sec\theta + 2) = 0$
- e. $(\cot\theta - \sqrt{3})(\tan\theta - \sqrt{3}) = 0$
- f. $(\sqrt{2}\cos\theta - 1)(1 + \sqrt{2}\cos\theta) = 0$
- g. $(\tan\theta - 1)(\tan\theta + 1) = 0$
- h. $(\cos\theta + 1)(\cos\theta - 1) = 0$

3. Solve each equation for θ , where $0^\circ \leq \theta < 360^\circ$.

- a. $\cos^2\theta - 1 = 0$
- b. $\tan^2\theta - 3 = 0$
- c. $2\cos^2\theta - 1 = 0$
- d. $4\sin^2\theta - 3 = 0$
- e. $3\cot^2\theta - 1 = 0$
- f. $\sec^2\theta - 2 = 0$

4. Solve each equation for θ , where $0^\circ \leq \theta < 360^\circ$.

- a. $2\sin^2\theta - 3\sin\theta + 1 = 0$
- b. $2\cos^2\theta + 3\cos\theta + 1 = 0$
- c. $2\sqrt{2}\sin^2\theta + 4\sin\theta + \sqrt{2} = 0$
- d. $6\sin^2\theta + \sin\theta - 1 = 0$
- e. $\sec^2\theta + 3\sec\theta + 2 = 0$
- f. $\csc^2\theta + 2\sqrt{2}\csc\theta + 2 = 0$
- g. $\tan^2\theta + \tan\theta - 2 = 0$
- h. $\sin^2\theta - \sin\theta - 6 = 0$

Answers:

1. a. $45^\circ, 315^\circ$ b. $30^\circ, 210^\circ$, c. $210^\circ, 330^\circ$ d. $120^\circ, 240^\circ$ e. $45^\circ, 225^\circ$ f. $135^\circ, 315^\circ$ g. $45^\circ, 225^\circ$ h. $135^\circ, 315^\circ$.
2. a. $60^\circ, 120^\circ, 240^\circ, 300^\circ$ b. $30^\circ, 150^\circ, 270^\circ$ c. $60^\circ, 240^\circ, 300^\circ$ d. $30^\circ, 150^\circ, 210^\circ, 330^\circ$ e. $30^\circ, 60^\circ, 210^\circ, 240^\circ$ f. $45^\circ, 135^\circ, 225^\circ, 315^\circ$ g. $45^\circ, 135^\circ, 225^\circ, 315^\circ$ h. $0^\circ, 180^\circ$.
3. a. $0^\circ, 180^\circ$ b. $60^\circ, 120^\circ, 240^\circ, 300^\circ$ c. $45^\circ, 135^\circ, 225^\circ, 315^\circ$ d. $60^\circ, 120^\circ, 240^\circ, 300^\circ$ e. $60^\circ, 120^\circ, 240^\circ, 300^\circ$ f. $45^\circ, 135^\circ, 225^\circ, 315^\circ$.
4. a. $30^\circ, 90^\circ, 150^\circ$ b. $120^\circ, 180^\circ, 240^\circ$ c. $225^\circ, 315^\circ$ d. $19.5^\circ, 160.5^\circ, 210^\circ, 330^\circ$ e. $120^\circ, 240^\circ, 180^\circ$ f. $225^\circ, 315^\circ$ g. $45^\circ, 117^\circ, 225^\circ, 297^\circ$ h. no solution.